A-FACTOR

HYALURONIC ACID SOLUTION
WITH POLYNUCLEOTIDE
AMINO ACIDS
VITAMINS
MINERALS
PEPTIDES
OTHERS

ZINIK

CONTENT

ZINIK

1-1. Technical Background

피부탄력

■ Collagen

- Protein that makes up the majority of the dermis fiber.
- important role in the elasticity of the dermis.
- Collagen synthesized in fibroblast

■ Elastin

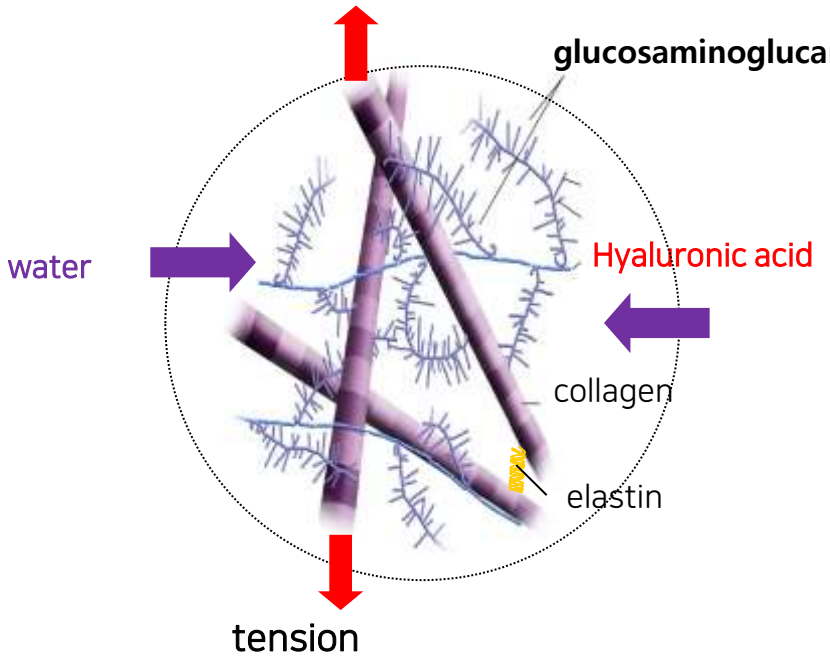
- **Elastic fiber** (The amount is the smallest among the dermis ingredients.)

피부보습

■Hyaluronic acid

- Synthetic/dialogic cycles are very short
- Continuously to maintain skin moisturization, Hyaluronic acid must be replenished

A-FACTOR and skin mechanism



- Collagen forms a three-dimensional structure, and elastin,a highly flexible elastic fiber, acts like a spring to maintain the elasticity of the skin.
- Hyaluronic acid fills the space between them to maintain the elastic structure

피부 탄력과 보습에 관여하는 콜라겐, 엘라스틴을 자극하고 히알루론산 외 다양한 유효성분을 피부에 공급하여 피부 활력 개선

1-2. Technical Background

Main ingredient

ingredient	Eng.	Kor.
Main Material	Hyaluronic acid	하이알루로닉애씨드
	Sodium polynucleotide	폴리뉴클레오타이드
Amino acids	Glutamic acid	글루타믹애시드
	Glycine	글라이신
	Taurine	타우린
Others	D-Glucose	글루코오스
	N-acetylcysteine	아세틸시스테인

ingredient	Eng.	Kor.
Vitamins	Vit B2(riboflavin)	리보폴라빈
	Vit B3(nicotinamide)	니코틴
	Vit B6(pyridoxine)	피리독신
Minerals	Sodium chloride	소듐크로라이드
Peptides	Glutathione	글루타티온
	Oligopeptide-1	올리고펩타이드-1
	Polypeptide-8	폴리펩타이드-8

※ A=FACTOR Summary of main components only

1-3. Technical Background

주요 성분별 효능

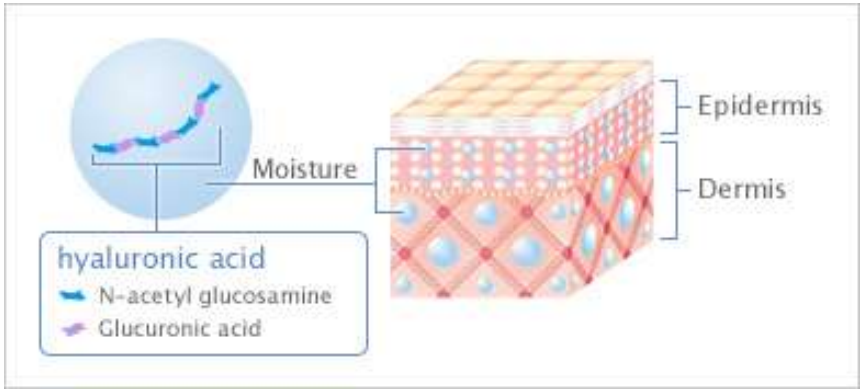
구분	주요 성분	효능
Hyaluronic acid		• Composition that forms the connective tissue of the dermal dermis, responsible for elasticity and moisturization • To reduce wrinkles and increase elasticity of the skin.
Polynucleotide		• Regenerate the skin barrier that fills thin, stretched skin and increases dermal thickness and overall elasticity. • The effect of speeding the recovery of the skin itself by promoting the secretion of growth factors in body tissues and improving the flow of blood vessels through the creation of new blood vessels.
Amino Acids	glutamic acid	• Form a moisture film to keep dry skin moist. • atopic dermatitis alleviation
	glycine	• Maintaining skin elasticity (a 30% component of collagen in cells) • skin tissue damage recovery
	Taurine	• Effect on whitening by engaging in the process of melanin formation • Anti-aging function / antioxidant function
Vitamins	Vit B2(riboflavin)	• effective in treating dermatitis • Keep rough skin smooth
	Vit B3(nicotinamide)	• Nicotine amide plays an important role in the DNA damage response. • function as an NAD precursor • It improves aging skin and soothes skin irritation
	Vit B6(pyridoxine)	• Keeping skin, hair, fingernails, and other tissues healthy by helping break down and synthesize proteins • Mitigate acne, effective for allergic dermatitis

Efficacy by main ingredient

ingredient	Main ingredient	Efficacy
Minerals	Sodium chloride	• deep line and wrinkle removal of skin • promotion of skin cell regeneration
Others	N-acetylcysteine	• antioxidant effect by preventing cell damage • Facilitates skin metabolism and is effective for whitening and acne.
	D-Glucose	• Moisture binding properties improve skin moisturization to prevent dryness and maintain moist skin. • Helps with vital skin, with calming effect
Peptide	Glutathione	• Prevent aging by inhibiting and removing the production of free radicals • Strengthen immunity, suppress melanin, effective for whitening skin
	Oligopeptide-1	• skin regeneration due to skin growth factor • Effect of increasing elasticity and inflammation of epidermal cells
	Polypeptide-8	• promotion of collagen synthesis in fibroblasts • Effects of epidermal cell division and skin regeneration on skin regeneration

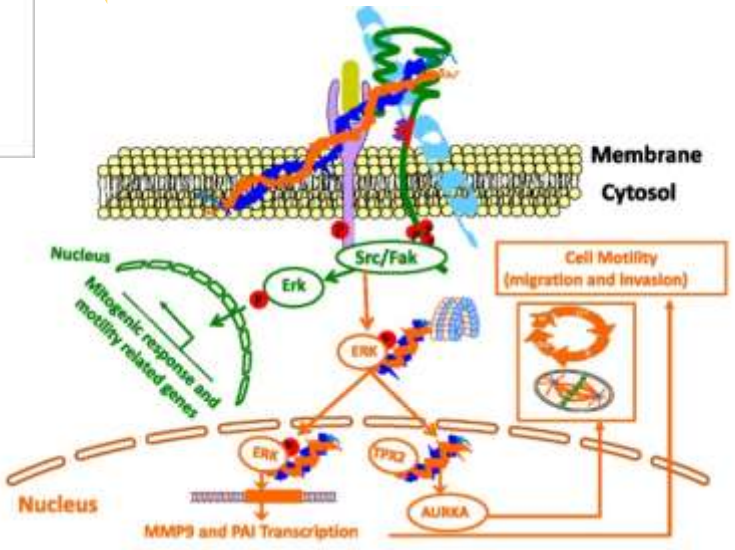
1-5. Technical Background

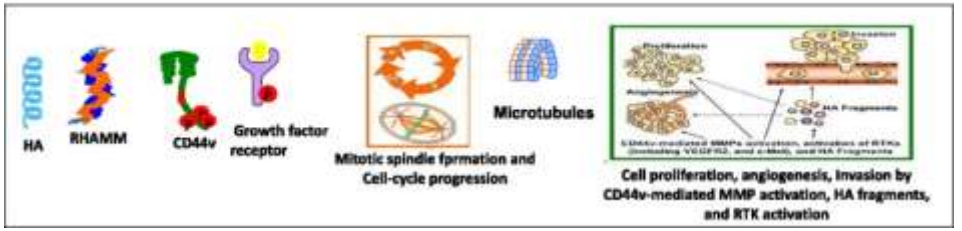
Hyaluronic Acid



- Hyaluronic acid acts on the dermis to show moisturizing effect
- It is a combination tissue of the dermis and is responsible for elasticity and moisturization.

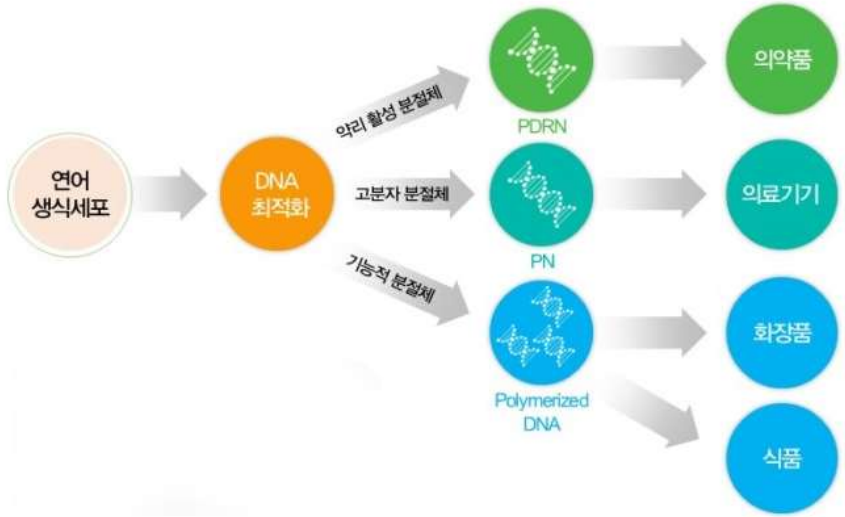
When hyaluronic acid meets cell mechanisms,
it shows cell proliferation, vascular generation, etc.

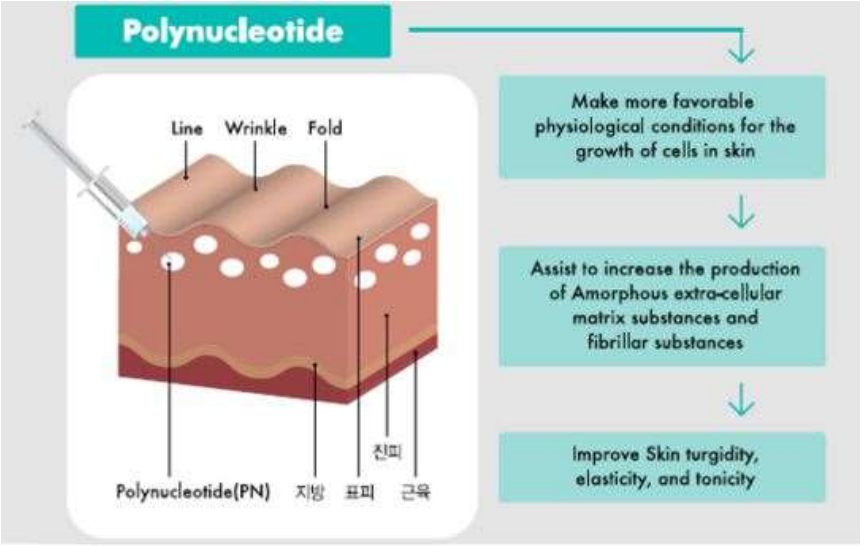




1-6. Technical Background

Polynucleotide

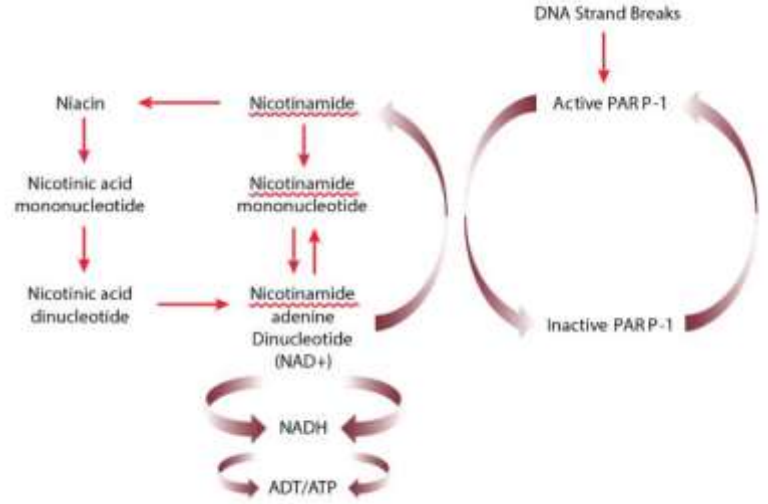




- the basic molecules that all living things have in common.
- human-fitting substance
- a complex of raw materials that make DNA from cells.

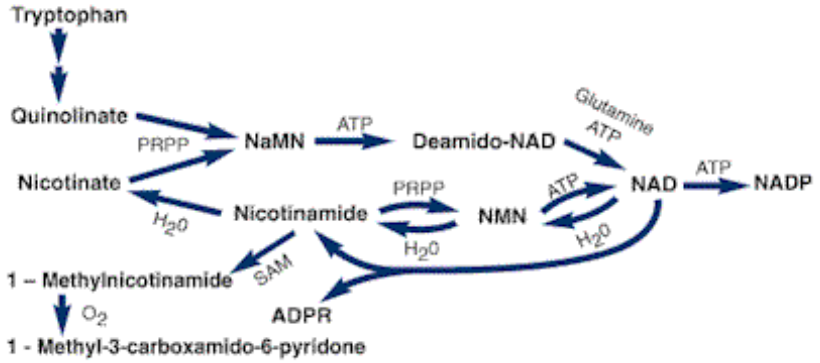
1-7. Technical Background

Vitamin B3 (Nicotinamide)



- Nicotine amide plays an important role in the DNA damage response.
- Nicotine amide functions as an NAD precursor
- PARP-1 is an important role in DNA repair as a substrate.
- nicotine amide and niacin are the main components of NAD synthesis
- Essential to ATP production and activation of PARP-1

Fig. 1: Principle Action of B3 Metabolism in the Body



- Nicotine amide improves aging skin
- Skin improvement effects

  wrinkles, pigmentation, red stains and

  reduced skin paleness, and increased elasticity.

2-1. Product characteristics

Package Information		
Volume	1 Package	10 Vials
	1 Vial	3mL
Package Size	166 * 135 * 67 (mm)	
Weight	Vial	14 g
	Total	260 g

2-2. Product characteristics

A-FACTOR

*A-FACTOR consists of components such as polynucleotides, peptides, amino acids, vitamins and minerals that represent multi-rebital effects and tissue regeneration effects of skin tissues.

*A-FACTOR is the first product to use polynucleotide in mesotherapy.

*A-FACTOR contains peptide components that have excellent anti-aging effects on the skin, so it's important to note that fibroblast cells have a very high level of risk of aging of the skin. Provide an optimal environment for reviving functionality

Apply Areas

The facial part,
the neck part,
the curved part of the neck,
hand,
etc

Target Skin

*dry skin

* Skin without elasticity

* Dark-toned skin

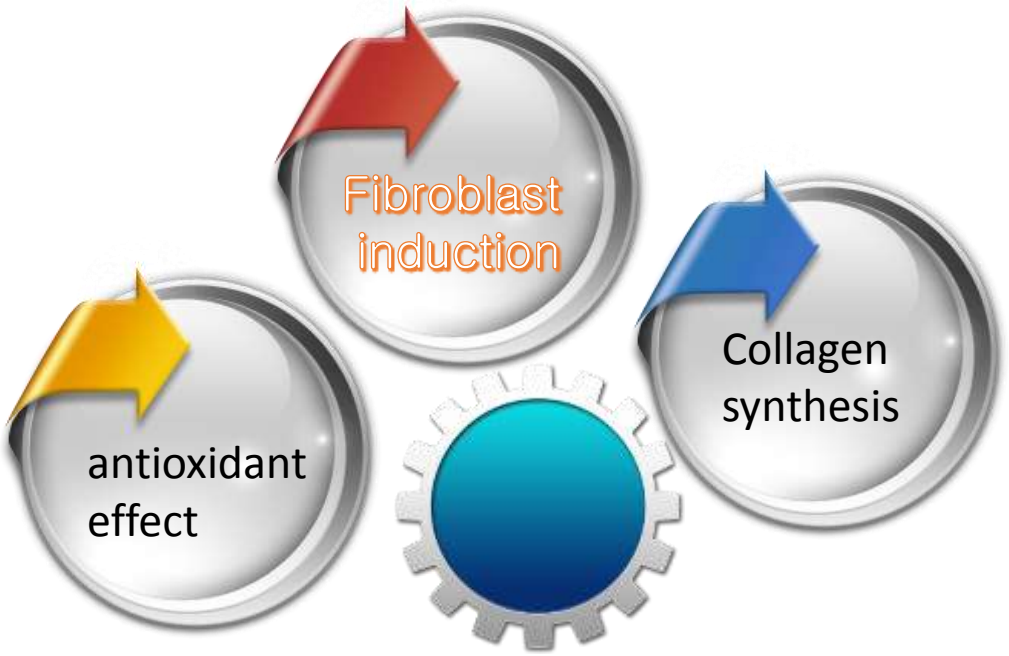
* Wrinkled skin

* sagging skin

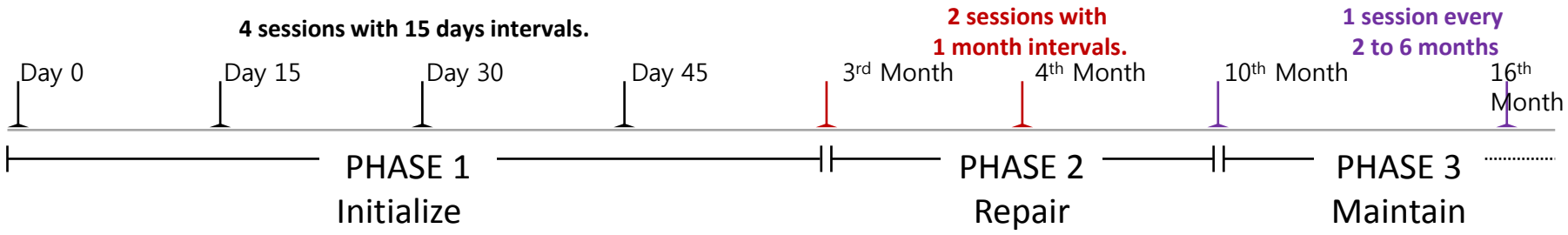
* lifeless skin

2-3. Product characteristics

A-Factor

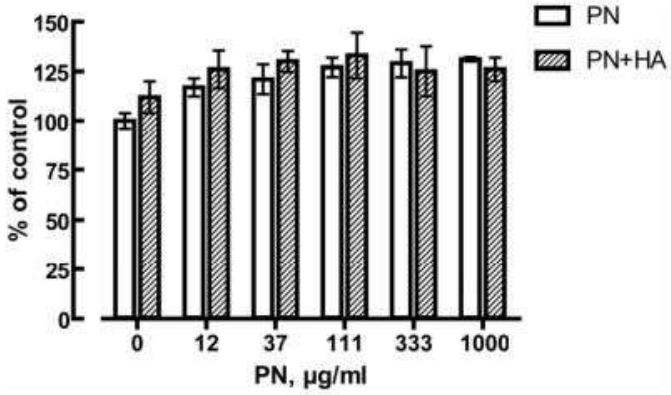


Protocol for A-Factor



3-1. Product Evaluation and Verification

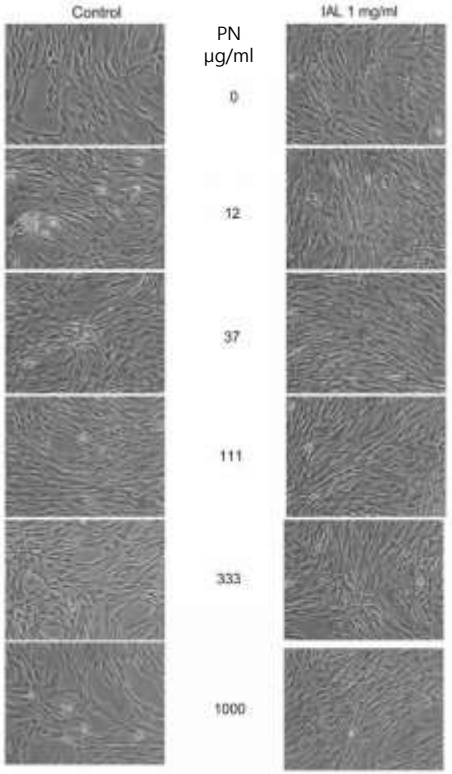
Hyaluronic acid & Polynucleotide



Processing of PN & PN+HA in cell by concentration

Figure : Different stimulation effects when using PN with HA than when using PN alone.
Cell growth rate is more effective in cells treated by mixing HA with low concentration than cell proliferation rate obtained by high concentration PN alone.

The combination of PN and HA makes it even more effective Cell activity can be expected



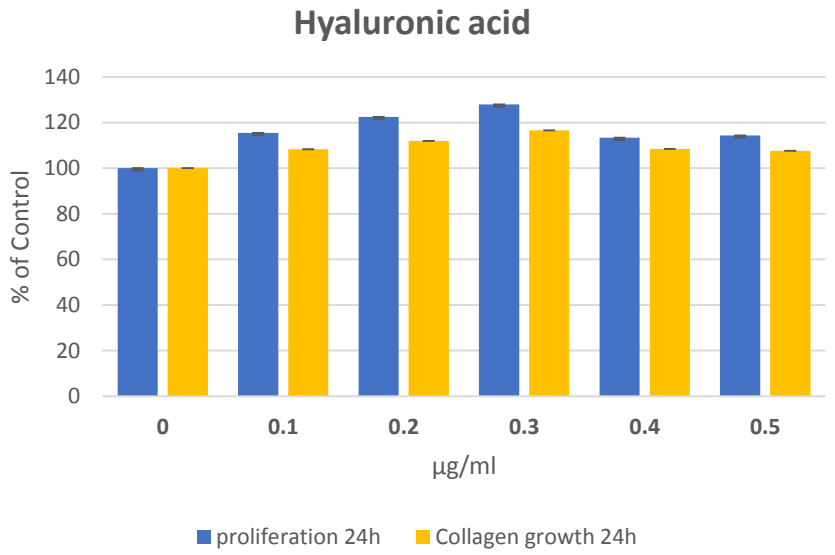
- Greater growth rate in cells containing HA than in PN alone

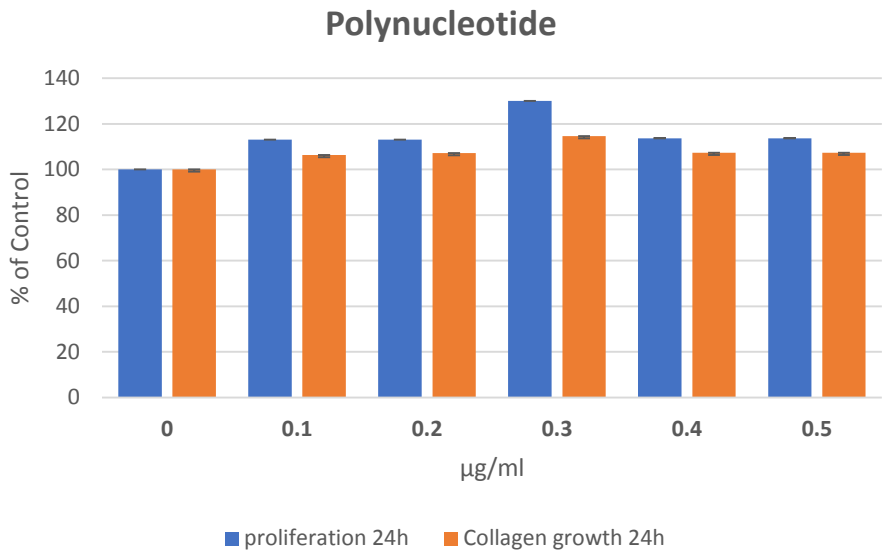
reference literature: Hyaluronate Increases Polynucleotides Effect on Human Cultured Fibroblasts, Stefano Guizzardi, journal of cosmetics, 2013;3,124-128

3-2. Product Evaluation and Verification

Main component test

Hyaluronic acid, polyinculotide-specific fibroblast cell proliferation & collagen production test



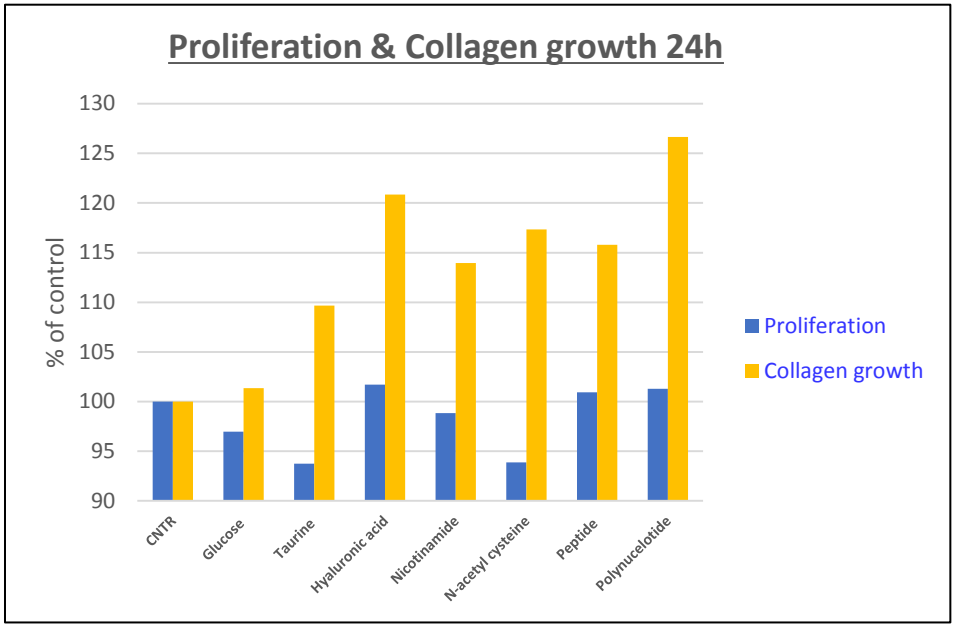


Fibroblast cell test by concentration			
Product	Hyaluronic acid, Polynucleotide		
Test institution	RENZEN research institute	method	WST-8 assay
Result	• Hyaluronic acid concentration 0.3% & Polynucleotide concentration 0.3% fibroblast proliferation increased more than 123% collagen synthesis increased more than 111%		
Conclusion	• At 0.3% Hyaluronic acid and 0.3% Polynucleotide, fiber cell growth and collagen production are excellent for skin improvement and regeneration		

3-3. Product Evaluation and Verification

Main component test

fibroblast cell proliferation & collagen production test by component



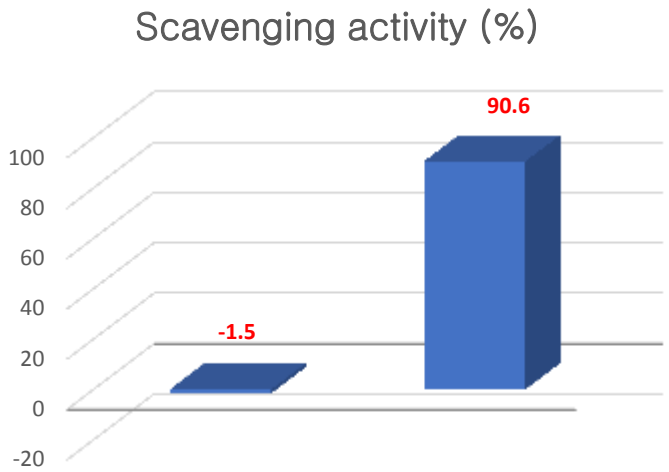
component	Fibroblast growth(%)	Collagen growth (%)
Glucose	96	101.3
Taurine	93	109.6
Hyaluronic acid	101	120.8
Nicotinamide	98	113.9
N-acetyl cysteine	93	117.5
Peptide	100	115.7
Polynucleotide	101	126.6

[Fibroblast proliferation & collagen synthesis Test]			
Product	A-FACTOR major component		
Test institution	RENZEN research institute	method	WST-8 assay
Result	• Hyaluronic acid, peptide, polyhynucleotide fibroids increased by more than 100% • Increased collagen production by more than 120% in Hyaluronic acid and Polynucleotide		
Conclusion	• The main ingredients of A-Factor, Hyaluronic acid and Polynucleotide, are increased fibrous cells and excellent for collagen production, which are effective for skin improvement regeneration		

3-4. Product Evaluation and Verification

Antioxidant effect test _ A-Factor Antioxidant effect 90.6% ↑

product		Concentration	Scavenging activity(%)
Negative control group	D.W	2.5%	-1.5
Positive control group	Ascorbic acid	10μM	49.0
		100μM	95.5
	Glutathione	10μM	6.2
Test product	A-Factor	2.5%	90.6 *
*DPPH 시험시, 대조군 대비 50% 이상의 라디칼 소거능을 나타낼 때 항산화 효능 소재로 판단한다.			



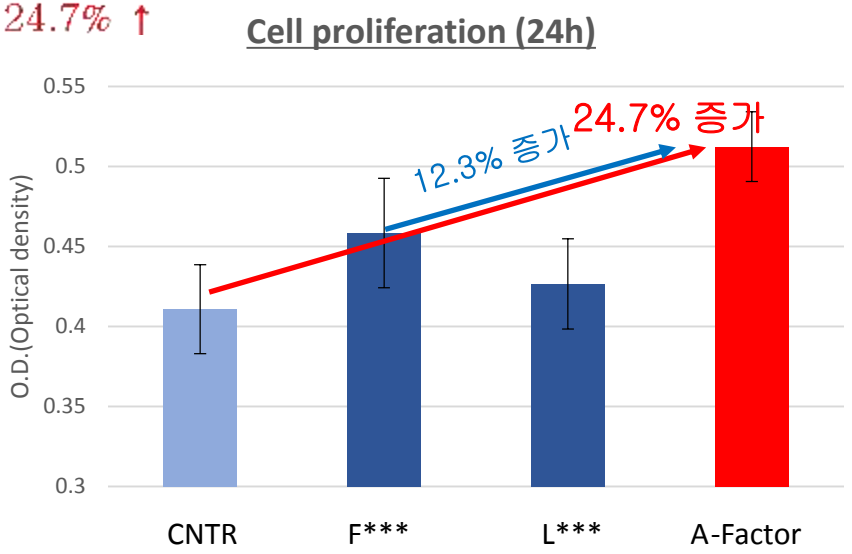
[Antioxidant test]

Product	A-FACTOR(RMT-20181031-E)				
Test institution	OATC skin clinical test center	Test date	2018. 10. 30.	Test management number	OATC-181030-IR0001
Result	• The antioxidant properties of the test product A-factor were found to be 90.6% antioxidant.				
Conclusion	• A-Factor has an antioxidant effect of about 90.6%, which helps prevent skin aging.				

3-5. Product Evaluation and Verification

Comparative evaluation keratinocyte grow effect with competitive products _ A-Factor keratinocyte

24.7% ↑



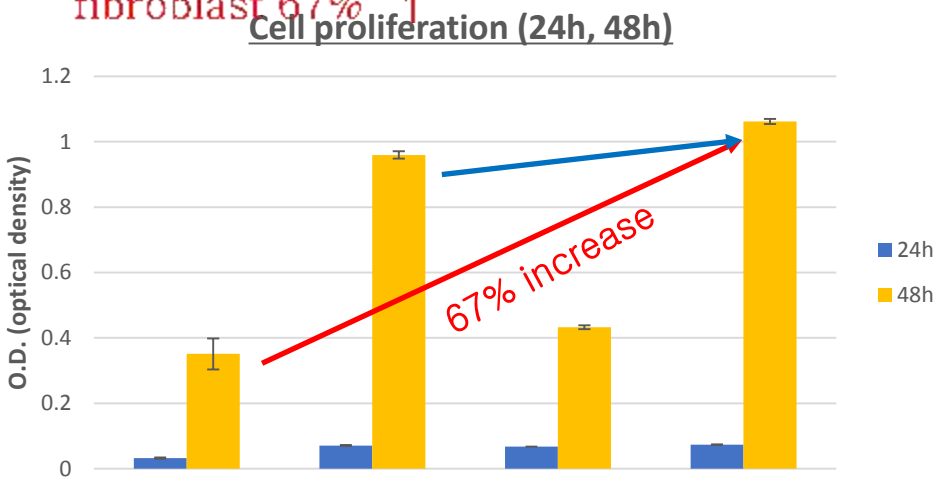
A-Factor is more effective in exfoliating cells than in competing products
Helps improve skin tone and skin texture by affecting skin surface layer regeneration

[keratinocyte proliferation assessment test]					
Product	A-FACTOR(RMT-20181031-E)		Test target cell	Keratinocyte / HaCaT	
Test institution	RENZEN research institute	Test date	2019. 01. 28.	Test method	WST-8 assay
Result	• Test product A-FACTOR : O.D(Optical density) Data 24.7% Increase • Test product F*** : O.D(Optical density) Data 11.6% Increase • Test product L*** : O.D(Optical density) Data 3.8% Increase				
Conclusion	A-FACTOR is observed to multiply cells about twice as much as F** for keratinocyte growth				

3-6. Product Evaluation and Verification

Comparative evaluation fibroblast growth effect with conpetitive products _ A-Factor

fibroblast 67% ↑

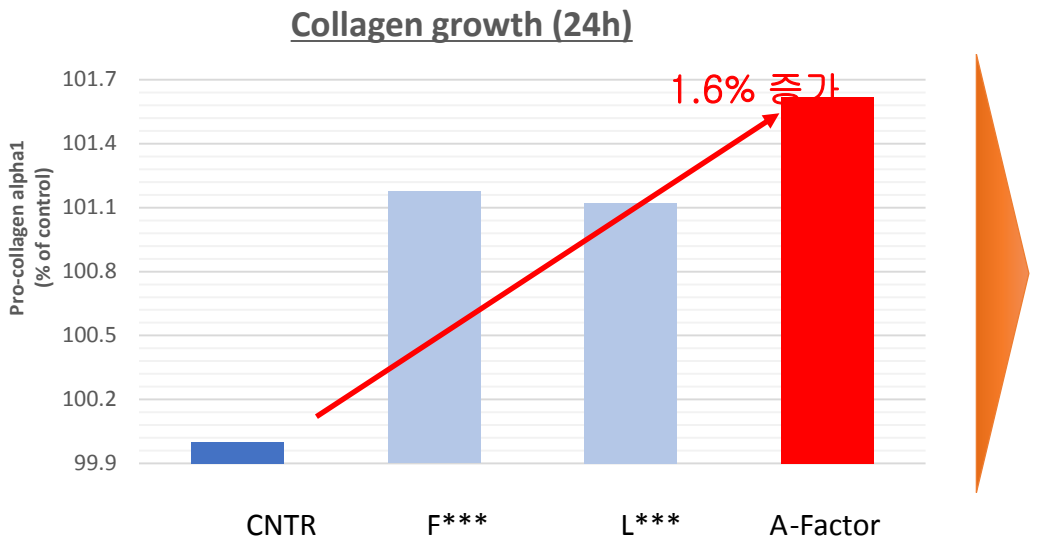


Fibroblast play an important role in the synthesis of extracellular matrix and collagen. Increases skin elasticity, reduces wrinkles, and moisturizes the skin, contributing to collagen production

[Fibroblast proliferation evaluation test]					
Product	A-FACTOR(RMT-20181031-E)		Test target cell	Fibroblast [섬유아 세포] / NHDF (Normal human dermal fibroblast)	
Test institution	Ulgi university clinical pathology institute	date	2019. 01. 28.	method	WST-8 assay
Result	• Test product A-Factor : O.D(Optical density) Data 67% increase • Test product F*** : O.D(Optical density) Data 63% increase • Test product L*** : O.D(Optical density) Data 18% increase				
Conclusion	• Fibroblast growth is observed to grow about 10% more fibrous cells in A-Factor than in competing products (F***).				

3-7. Product Evaluation and Verification

Collagen synthesis effect comparative test

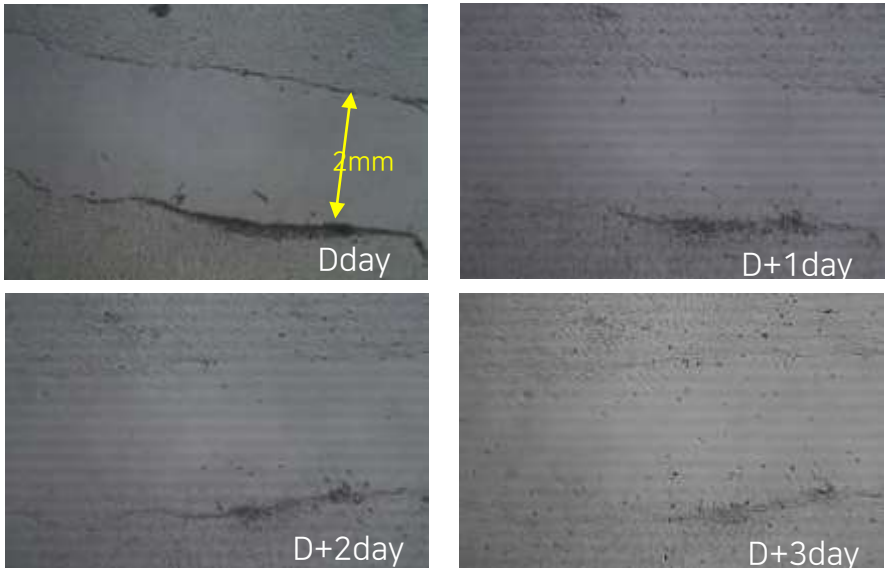


- A-Factor's PN component is more effective in producing fibrous cell collagen than in competing products
  Collagen-producing effects for moisturizing, improving skin texture, and improving elasticity

[Fibroblast collagen synthesis test]					
Product	A-FACTOR(RMT-20181031-E)		Test target cell	Fibroblast / NHDF	
Test institution	RENZEN research institute	date	2019. 01. 28.	method	Human pro-collagen assay
Result	• A-FACTOR : Collagen growth increase more than 1.6%. • Test product F*** : Collagen growth increase more than 1.1%. • Test product L*** : Collagen growth increase more than 0.9%.				
Conclusion	A-Factor is expected to help regenerate the skin as it is effective in producing collagen.				

3-8. Product Evaluation and Verification

Wound healing effect comparative test _ A-FACTOR : rapid effect ↑



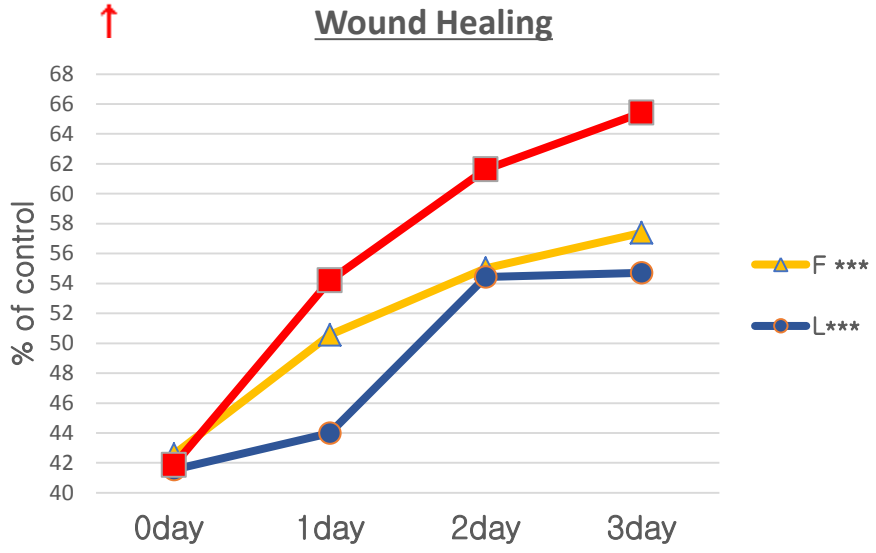
A_FACTOR can be recovered quickly even if the microneedle (MTS) creates a number of fine holes in the skin.
Safely passes through the stratum corneum and reaches the dermis to induce skin regeneration, resulting in a quick and excellent effect in a short period of time.
Minimize pain and wound that accompanies MTS procedures

[Fibroblast Wound healing test]

Product	A-FACTOR(A-FACTOR-20181031-E)		Test target cell	**Fibroblast / NHDF**	
Test institution	Ulgi university clinical pathology institute	date	2019. 01. 28.	mathod	Wound healing test
Result	• A-FACTOR Wound healing capacity : recovery more than 65% for 3 days • Test product F*** Wound healing capacity : recovery more than 58% for 3 days • Test product L*** Wound healing capacity : recovery more than 54% for 3 days				
Conclusion	A-FACTOR is expected to have a quick wound recovery effect and active collagen production.				

3-9. Product Evaluation and Verification

Wound healing effect comparative test _ A-FACTOR wound healing 65% recovery



The A-Factor can recover quickly even though 0.6mm microenaries create a number of fine holes in the skin.

Safely passes through the A-Factor stratum of dead skin and reaches the dermis to induce skin regeneration, resulting in fast and excellent effects in a short period of time

Expected to show rapid skin improvement and collagen production by showing amazing resiliency of 65% or more over 3 days

[섬유아 세포 Wound healing 시험]					
Product	A-FACTOR(RMT-20181031-E)		Test target cell	Fibroblast / NHDF	
Test institution	Ulgi university clinical pathology institute	date	2019. 01. 28.	method	Wound healing test
Result	• A-FACTOR Wound healing capacity : recovery more than 65% for 3 days • Test product F*** Wound healing capacity : recovery more than 58% for 3 days • Test product L*** Wound healing capacity : recovery more than 54% for 3 days				
Conclusion	A-FACTOR is expected to have a quick wound recovery effect and active collagen production.				

Thank YOU

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